**Unit VII. OPERATION SYSTEMs**

*VOCABULARY STUDY*

**Word List**

***Nouns and noun phrases***

Utilization ─ использование; allocation ─ размещение, распределение; detection ─ обнаружение; pen drive ─ флеш-накопитель; process scheduling ─ многозадачный режим, диспетчеризация процессов; collective ─ совокупность; request ─ запрос; response ─ ответ, отклик; aid ─ помощь; buffer delay ─ задержка буфера; accounting ─ учёт использования ресурсов; constraint ─ ограничение; delay ─ задержка;

***Adjectives and collocations***

Predictable ─ предсказуемый; unauthorized ─ неавторизованный, неразрешенный; similar ─ похожий;

***Verbs, Adverbs***

Occur ─ происходить, случаться; perform batch job ─ выполнять работу в пакетном режиме; assign ─ назначать.

**I. Match the words with the definitions below.**

*Allocation, batch,* *capability, unauthorized, assign, disastrous,* *impact, queue, requirement.*

1. A group of things that are dealt with or produced at the same time, or a group of people who are similar in some way.

2. To give a particular job or piece of work to someone.

3. Extremely bad or unsuccessful.

4. The process of giving someone their part of a total amount of something to use in a particular way.

5. The ability or power to do something.

6. Without someone's official permission to do something or be in a particular place.

7. An official rule about something that it is necessary to have or to do.

8. A powerful effect that something, especially something new, has on a situation or person.

9. A list of jobs that a computer has to do.

**II. Using a dictionary add as many words as possible into the table.**

|  |  |  |
| --- | --- | --- |
| ***Verbs***  1. to manage  2. to detect  3. to perform  4. to attach  5. to allocate  6. to predict  7. to require | ***Adjectives***  manageable  detected  performed  attached  allocated  predictive  required | ***Nouns***  management  detection  performance  attachment  allocation  prediction  requirement |

**III. Choose the words with similar meaning from the two groups and arrange them in pairs.**

A. Keep, sense, multi-programming, internal, device, error, process, unauthorized;

B. Memory, user, scheduling, management, general, a track, environment, prevention.

**IV. Complete the sentences with the words below. You may have to change some words slightly.**

*Data,* *virus attack, log,* *response time, frequency, unauthorized access, password,* *task, boost, system performance.*

Security is provided by OS to the user data and prevents (1). Data can be protected by giving the (2) to the files. When an unknown user checks the files, OS asks for the password and hence the (3) is protected. The system itself is protected with a password. This helps in checking the persons who (4) into the system.

System performance is maintained with the help of the OS. It monitors the (5) taken by the system after the service request. If there is any unusual variation in the time, OS monitors the (6) and brings the issue into the user’s notice. High variation or very low variation can be the result of any (7). The user is notified to bring the necessary changes. Various applications or tasks and the number of users doing the (8) are accounted for by OS. This helps to know the number of users and the (9) of application usage.

**V. Correct the definitions. Put the derivatives of the word LOAD given in bold into their proper places in the sentences.**

1. If you have something **overloaded** you have the information or software applications loaded for you before you start using it. 2. If you have something **freeloaded** you want the information to be shown on the screen again, usually because there has been a problem or because you want the information to be as new as possible. 3. If you have something **downloaded** you copy or move programs or information to a larger computer system or to the Internet. 4. If you have something **uploaded** you copy or move programs or information into a computer's memory, especially from the internet or a larger computer. 5. If you have something **reloaded** you load it onto your computer without being charged. 6. If you have something **preloaded** your computer is supplied with too much information to be processed.

**VI. Translate the following sentences into English.**

1. Операционная система организует работу как программного, так и аппаратного обеспечения ПК: одновременный запуск нескольких приложений, обработку и выполнение команд центральным процессором, сохранение файлов на ПК или внешнем жестком диске, управление памятью компьютера и другие функции. 2. Таким образом, набор ключевых функций ОС включает в себя установку программных утилит для настройки работы приложений и устройств компьютера. 3. Операционная система выполняет ключевую роль в обеспечении работы как встроенных, так и загружаемых приложений. 4. По статистике, пользователи операционной системы Windows составляют около 90%, в то время как Mac пользуется только около 10% . На самом деле, первая является более доступной и дешевой для пользователей ПК, а последняя более дорогой. 5. Многие программисты пользуются операционной системой Linux, главное преимущество которой, – ее открытый доступ, позволяющий пользователю редактировать системные утилиты. Данная ОС является более надежной, защищенной от шпионских расширений и менее подверженной вирусным атакам. 6. Командный интерфейс менее удобен в использовании, чем графический интерфейс, так как каждое меню быстрого доступа, всплывающее и выпадающее меню предлагают пользователю широкий выбор опций, доступных нажатием клавиши мышки. 7. – Какая операционная система установлена на твоем смартфоне? – Это Андроид. Она поддерживает различные приложения и регулярно обновляется.

Перевод

1. The operating system organizes the operation of both software and hardware of the PC: simultaneous launch of several applications, processing and execution of commands by the central processor, saving files on a PC or an external hard disk, computer memory management and other functions. 2. Thus, the set of key OS functions includes the installation of software utilities to configure the operation of applications and computer devices. 3. The operating system plays a key role in ensuring the operation of both embedded and downloadable applications. 4. According to statistics, users of the Windows operating system make up about 90%, while Mac uses only about 10%. In fact, the former is more affordable and cheaper for PC users, and the latter is more expensive. 5. Many programmers use the Linux operating system, the main advantage of which is its open access, allowing the user to edit system utilities. This OS is more reliable, protected from spyware extensions and less susceptible to virus attacks. 6. The command interface is less user-friendly than the graphical interface, since each quick access menu, pop-up and drop-down menus offer the user a wide range of options available by pressing the mouse button. 7. – What operating system is installed on your smartphone? – It's an Android. It supports various applications and is regularly updated.

*A. TEXT STUDY*

**I. Read the text and answer the following questions.**

1. What is the definition of an Operating System?

2. How does an operating system manage hardware resources?

3. What are the functions of OS?

4. What allocates and de-allocates the device efficiently?

5. What is a File System?

6. What is job accounting used for?

7. What can a broad family of operating systems be categorized into?

8. What types can Real Time systems be classified into?

**TEXT A.** **Operating Systems**

An Operating System (OS) is a powerful program that manages and controls the software and hardware on a computing device so as to make the device behave in a predictable but flexible way. An OS acts an interface between a user and a device. Thus, in general sense, an OS is that software which helps a user to run other applications on his computing device.

All the computers and computer-like devices comprise Operating System, including laptop, desktop, or any other smart computing system like a smart phone or a smart watch. Some of the popular OS are Linux, OS X, WINDOWS, VMS, OS/400, AIX, z/OS, etc.

The OS performs multiple functions and management. It manages computer’s hardware resources by performing required services:

Front end management of hardware resources. It manages Input and Output devices such as a mouse, keyboard, display monitors, scanners and printers; it manages network devices such as routers, modems and network connections; it manages storage devices, both internal and external drives.

Back end utilization of software applications for managing hardware resources. It manages the allocation of internal memory between multiple applications. An OS sends message about the status of operation and any error that may have occurred to the interactive user. It helps in performing batch jobs for example, printing etc. Depending on the capability of devices that can offer parallel processing, a program is managed by OS such that it can run on more than one processor at a time.

The functions of an OS include: Memory Management. Device Management. Processor Management. File Management. Controls System Performance. Security. Error Detection. Coordination among Software and Users. Job accounting.

*Memory Management.* One of the main functions of OS is to manage the primary and secondary memory. All the memory devices such as hard disk, pen drive etc. are managed by OS. Memory management keeps an eye on each and every memory location, in any case either it is allocated or it is not allocated (free). Memory allocation to the processes is also decided and checked by Operating System. It decides and checks which process will obtain memory and at what time.

*Device Management.* An OS with help of their respective drivers manages device communication. Following activities are performed by an Operating System for device management: It keeps a track of all devices. This task is performed by I/O controller. It decides which process will get the device, when and for how long. It allocates and de-allocates the device efficiently.

*Processor Management.* In a multi-programming environment, it is OS which decides which process will get the processor when and for how long. This task is called Process Scheduling. Following activities are done by OS for processor management: It keeps a track of processor tasking and checks the status of process. Traffic controller performs this task. It allocates the processor and also de-allocates processor when a process is complete and not required.

*File Management.* In a file system, generally directories are organized for usage and easy navigation. Following activities are performed by an OS under file management: It keeps a track of location, information, status etc. This collective is known as File System. It decides who will get the resources. It allocates and de-allocates the resources.

*Controls System Performance.* An OS records delays between a request and response of the system.

*Security.* An OS by using password and other similar techniques prevents and checks unauthorized users to access the data and program.

*Error Detection.* By using various error detecting aids an operating system helps in prevention of errors.

*Coordination among Software and Users.* It Coordinates and assigns compilers, assemblers, interpreters and other software to users.

*Job accounting.* It keeps a track of resources and jobs used by different users all the time.

**Types of Operating Systems**

The broad family of operating systems can be categorized in to four types based on their controlling and supporting systems. These types of Operating System are: *Real Time Operating System* (RTOS); *Single User Single Task* OS; *Single User Multi Tasking* OS; *Multi User* OS.

A *Real Time Operating System* (RTOS) intends to provide real time applications that process data without buffer delays. A Real Time Operating System is a time bound operating system which has fixed time constraints. Processing has to be done within the defined time constraints or the system will definitely fail. Examples of Real Time systems are Air Traffic Control Systems, Command Control Systems etc.

Real Time systems are classified in three types depending on two factors i.e. on factors inside the computer system and factors outside the computer system. A missed deadline in Hard Real Time Systems is disastrous. In case of Soft Real Time Systems it may lead to a significant loss. In Firm RTOS, the deadline is specified but missing it does not cause a big impact.

Command Control systems and Air traffic control systems are best examples of Hard Real Time systems. Online transaction systems, like booking a movie ticket or airline reservation systems are best examples of Soft Real Time systems. Multimedia applications is one example of Firm RTOS.

*Single User Single Task* Operating System. As the name indicates, Single User Single Task OS is a system in which only one program is executed at one time. It manages the computer in a way that one user can successfully perform one thing at a time. There is a problem with these types of Operating System that the program has to be arranged in a queue.

*Single User Multi Tasking* Operating System. Most people use this Operating-System on their computers, laptop and desktops today. Best examples of these types of Operating System are Apple’s Mac OS platform and Microsoft’s Windows. This Operating System will allow a single user to operate several programs at the same time. For example, a Windows user may be writing an e-mail while printing a word document while downloading a file from Internet.

*Multi User* Operating System allows various different users on different desktop or computer to access a single System. A user at the terminal or desktop, through a network takes access of the system and other system attached machines such as printers.

The Operating System takes care of all the requirements of the various users in a balanced manner. Also, it ensures that each of the programs being used has a separate and sufficient resource so that problem of one user doesn’t affect the entire community of users.

**II. Choose the best option to the following statements.**

1. An OS acts an interface between …

a) a user and a troubleshooter.

b) a device and a developer.

c) a user and a device.

2. The OS performs multiple functions and management. It manages

a) computer’s hardware resources.

b) computer’s software resources.

c) computer’s spyware resources.

3. The functions of an OS include:

A) Memory Management. Device Management. Processor Management.

b) File Management. Controls System Performance. Security. Error Detection.

c) all of the above

4. File management keeps a track of …

a) location, information, status etc.

b) input/output devices.

c) processor tasking and checks the status of process.

5. Real Time systems are classified in three types:

a) Hard Real Time Systems, Soft Real Time Systems, Firm RTOS.

b) Single User Single Task system; Single User system; Multi Tasking system.

c) Command control systems; Traffic control systems; Air traffic control systems.

**III. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

1. An OS is that hardware which helps a user to run other applications on his computing device.

2. Back end utilization of software applications for managing hardware resources manages the allocation of external memory between multiple applications.

3. One of the main functions of OS is to manage the primary and secondary memory.

4. An OS records errors between a request and response of the system.

5. Operating System will allow a single user to operate several programs alternatively.

6. An OS by using password and other similar techniques prevents and checks unauthorized users to access the data and program.

7. OS keeps a track of processor tasking and checks the status of process for error detection.

8. Real Time systems are classified in three types depending on two factors i.e. on factors inside the computer system and factors outside the computer system.

**IV. Complete the sentences with one of the words in the necessary form.**

*Utilities, configuration, core, modify, tend, distribute, drop-down, account for, preloaded, pull-down, upgrade, enhanced, task bar, platforms.*

1. There are several \_\_\_ functions that the operating system performs such as starting and shutting down a computer, \_\_\_ provision, devices \_\_\_ and others.

2. Operating systems usually come\_\_\_ on any computer you buy, but it is possible to \_\_\_ it.

3. Apple and Windows OSs have developed \_\_\_ software being regularly upgraded.

4. A user gets access to system functions by selecting program icons as well as other items from \_\_\_ and \_\_\_ menus and the \_\_\_.

5. In fact, most computing resources are built on the Windows and Apple \_\_\_.

6. Linux is the only open-source operating system, the flavor of which is the possibility for any user to \_\_\_ and \_\_\_ it.

7. Apple computers, which \_\_\_ 9.5% of the operating systems market, \_\_\_ to be much more expensive.

**V. Choose the necessary modal verb.**

1. The senior manager (can/is to/ might) check the ongoing updates of a new system. 2. To be loaded successfully the file (have to/ could/ should) be free of viruses. 3. The Start menu (may/should/ought to) provide a customizable list of programs for the user. 4. The start menu of a new OS Windows (had to/could/might) be expanded to encompass various My Documents folders. 5. Social bookmarking websites (are to /can/may) centralize online services, which allow users to store and share Internet bookmarks. 6. A screenshot reader is a form of assistive technology (AT) which (have to/can/ should) be very useful for people who are blind.

**VI. Speaking. Choose an operating system and speak about its usability. Use the prompts below. Share your opinion with the groupmates.**

*Usability, interface, advantages and disadvantages, most common applications, ease of use and prospects of developing.*

*B. TEXT STUDY*

**I. Read the text and answer the following questions. Entitle the text.**

1. What did IBM contact Bill Gates for?

2. Was MS-DOS successful enough to dominate the IBM PC market?

3. Who invented the GUI (Graphical User Interface)? What is GUI?

4. What did Steve Jobs embark on an Apple?

5. What company was strongly influenced by the success of the Macintosh?

6. What was the first iOS for Apple’s mobile operating system?

7. What new features were added to the OS Windows 7?

8. When did Google launch Chrome OS?

9. What are we to expect in the future OS?

In the early 1980s, IBM designed the IBM PC and looked around for software to run on it. People from IBM contacted Bill Gates to license his BASIC interpreter. They also asked him if he knew of an operating system to run on the PC. Gates suggested that IBM contact Digital Research, then the world's dominant operating systems company. Consequently, IBM went back to Gates asking if he could provide them with an operating system.

When IBM came back, Gates realized that a local computer manufacturer, Seattle Computer Products, had a suitable operating system, DOS (Disk Operating System). Gates then offered IBM a DOS/BASIC package, which IBM accepted. IBM wanted certain modifications, so Gates hired the person who wrote DOS, Tim Paterson, as an employee of Gates' company, Microsoft, to make them. The revised system was renamed MS-DOS (MicroSoft Disk Operating System) and quickly came to dominate the IBM PC market.

Although the initial version of MS-DOS was fairly primitive, subsequent versions included more advanced features, including many taken from UNIX. CP/M, MS-DOS, and other operating systems for early microcomputers were all based on users typing in commands from the keyboard. That eventually changed due to research done by Doug Engelbart at Stanford Research Institute in the 1960s. Engelbart invented the GUI (Graphical User Interface), complete with windows, icons, menus, and mouse. These ideas were adopted by researchers at Xerox PARC and incorporated into machines they built.

One day, Steve Jobs, who co-invented the Apple computer in his garage, visited PARC, saw a GUI, and instantly realized its potential value, something Xerox management famously did not. Jobs then embarked on building an Apple with a GUI. This project led to the Lisa, which was too expensive and failed commercially. Jobs' second attempt, the Apple Macintosh, was a huge success, not only because it was much cheaper than the Lisa, but also because it was user friendly, meaning that it was intended for users who not only knew nothing about computers but furthermore had absolutely no intention whatsoever of learning.

When Microsoft decided to build a successor to MS-DOS, it was strongly influenced by the success of the Macintosh. It produced a GUI-based system called Windows. For about 10 years, from 1985 to 1995, Windows was just a graphical environment on top of MS-DOS. However, starting in 1995 a freestanding version of Windows, Windows 95, was released that incorporated many operating system features into it, using the underlying MS-DOS system only for booting and running old MS-DOS programs. In 1998, a slightly modified version of this system, called Windows 98 was released. Nevertheless, both Windows 95 and Windows 98 still contain a large amount of 16-bit Intel assembly language.

Another Microsoft operating system is Windows NT (NT stands for New Technology), which is compatible with Windows 95 at a certain level, but a complete rewrite from scratch internally. It is a full 32-bit system. Version 5 of Windows NT was renamed Windows 2000 in early 1999. That did not quite work out either, so Microsoft came out with yet another version of Windows 98 called Windows Me (Millennium edition).

On March 6, 2008, iPhone OS 1 was the first iOS for Apple’s mobile operating system. No official name was given to the system. Apple stated that the iPhone ran on a version of its desktop operating system macOS, then known as Mac OSX. When Apple released the iPhone software development kit (iPhone SDK), it then named the operating system as iPhone OS which later on became iOS.

On September 23, 2008, Android was released. Android is a Mobile OS which was developed by Google. Based on the Linux Kernel and other Open Source software. It is designed mainly for Touchscreen devices although there are other renditions of the OS. Android is IOS’s first major competitor.

On October 22, 2009, Microsoft launched Windows 7 internationally to the public.

Windows 7 was intended to be an upgrade of Windows Vista, its predecessor and addressed Vista’s poor critical reception while maintaining its hardware and software compatibility.

New features were also added to the OS such as Libraries, HomeGroup — a file sharing system, support for multi-touch input, “Action Center” interface for an overview of maintenance information and system security, and edits were made to the User Account Control to make it less intrusive.

On May 2011 Google launched Chrome OS which is a Linux Kernel based OS. It is a free software which uses the Google Chrome web browser as it’s a primary user interface (UI) and supports web applications.

Its User Data runs directly off of the cloud, making it the first OS to be cloud-based.

After reviewing some of the most well-known operating systems through the generations, it is evident that there has been a huge advancement in the world of operating systems and how these systems have become more user-friendly and graphics-oriented in order to deliver the best product for engagement to the end user.

Looking at all the OS predecessors there is a lot more to expect in the future.

We are currently on the precipice of AI, robotics, and blockchain and these sectors will lead us towards different dimensions of Operating Systems.

**II. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

1. The initial version of MS-DOS included advanced features, including many taken from UNIX.

2. Steve Jobs invented the GUI (Graphical User Interface), completed with windows, icons, menus, and mouse.

3. Jobs' second project, called Lisa, was a huge success.

4. Lisa was user friendly, meaning that it was intended for users who not only knew nothing about computers but furthermore had absolutely no intention whatsoever of learning.

5. Windows NT was a complete rewrite from scratch internally.

6. Android is a Mobile OS which was based on the Linux Kernel and other Open Source software.

7. On October 22, 2009, Microsoft launched Windows NT internationally to the public.

8. Chrome OS is a free software which uses the Google Chrome web browser as it’s a primary user interface (UI) and supports web applications.

**III. Match the words having a similar meaning.**

1. To upgrade; 2. A wide selection of; 3. Crucial; 4. To coordinate; 5. To be prone to attacks; 6. Security; 7. Embedded; 8. Modern; 9. To navigate; 10. To install; 11. Compatible.

a. Vulnerable to viruses; b. A wide variety of; c. The latest; d. To route; e. To update; f. Consistent with another; g. Essential; h. To set up; i. Safety; j. To control;

k. Built-in.

**IV. Complete the sentences by giving the opposite form of the adjective in italics.**

*Example: Windows OS is more secure to use than Mac OS. –Windows OS is less secure to use than Mac OS.*

1. Torch browser is the least reliable to surf the Internet. 2. Apple platforms are cheaper than those of Windows. 3. Smartphones are sold at more affordable prices than 10 years ago. 4. Asus computers are far less playful, and less powerful than they used to be 3 years ago. 5. This software is the best I have ever used before. 6. Sony focuses on the worst, less coherent, the least usable features for its users.

**V. Complete the gaps in this text on OS using these linking words and phrases.**

*Although, because, but, in addition, such as, therefore*

The user is aware of the effects of different application programs (1) … operating systems are invisible to most users. They lie between application programs, (2) … word processing, and the hardware. The supervisor program is the most important. It remains in memory, (3) … it is referred to as resident. Others are called non-resident (4) … they are loaded into memory only when needed. Operating systems manage computer resources, (5) … the central processing unit. (6) …, they establish a user interface, and execute and provide services for application software. (7) … input and output operations are invoked by application programs, they are carried out by the operating system.

**VI. Fill in the article and answer the questions.**

1. What is the difference between application software and OS?

2. Why is the supervisor program the most important OS program?

3. What is the difference between resident and non-resident programs?

4. What are the main functions of an operating systems?

**Operating Systems: hidden software**

When … brand new computer comes out off … factory assembly line, it can do nothing. … hardware needs software to make it work. Are we talking about applications software such as word processing or spreadsheet software? Partly. But … applications software package does not communicate directly with the hardware. Between … application software and … hardware is … software interface - … operating system. … operating system is … set of programs that lies between applications software and … computer hardware.

… most important program in … operating system, … program that manages … operating system, is … supervisor program, most of which remains in memory and is thus referred to as resident. … supervisor controls … entire operating system and loads into … memory other operating system programs (called non-resident) from disk storage only as needed.

… operating system has three main functions:

1. manage … computer’s resources, such as … central processing unit, memory, disk drives, and printers;

2. establish … user interface;

3. execute and provide services for application software. Keep in … mind, however, that much of … operating system is hidden from … user. In particular, … first listed function, is taken care of without user being aware of … details.

Furthermore, all input and output operations, although invoked by … applications program, are actually carried out by … operating system.

**VI. Give the main points of the text B. Use the following clichés:**

*The text is about … . In the next paragraph … . The text elucidates … . It should be noted, that … . The text gives a good insight into … . To conclude … .*